

I claim:

1. Aluminum-free borosilicate glass with chemical resistance and having a composition, in percent by weight, based on oxide content, of:

SiO₂ 60 - 78

B₂O₃ 7 - 20

Li₂O 0 - 2

Na₂O 0 - 4

K₂O 3 - 12

MgO 0 - 2

CaO 0 - 2

with MgO + CaO 0 - 3

BaO 0 - 3

ZnO 0 - 2

ZrO₂ 0.8 - 12

TiO₂ 0 - 10

CeO₂ 0 - 1

F⁻ 0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

2. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	67 - 75
B ₂ O ₃	9 - 18
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	5 - 10
with Li ₂ O + Na ₂ O + K ₂ O	5.5 - 13.5
CaO	0 - 1
BaO	0 - 1
ZnO	0 - 1
TiO ₂	0 - 1
ZrO ₂	0.8 - 10.5
CeO ₂	0 - 0.4
F ⁻	0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

3. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	68 - 74
B ₂ O ₃	9 - 13
Li ₂ O	0 - 1

Na ₂ O	0 - 3
K ₂ O	5 - 10
with Li ₂ O + Na ₂ O + K ₂ O	5.5 - 13.5
ZrO ₂	3 - 7
CeO ₂	0 - 0.4
F ⁻	0 - 0.6

and optionally at least one refining agent in a standard amount for refining.

4. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	71 - 74
B ₂ O ₃	9 - 12
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	7 - 10
with Li ₂ O + Na ₂ O + K ₂ O	7 - 13.5
ZrO ₂	4 - 7,

and optionally at least one refining agent in a standard amount for refining.

5. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	68 - 71
B ₂ O ₃	8 - 11

Li_2O	0 - 1
Na_2O	0 - 3
K_2O	8 - 11
with $\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$	8 - 13.5
ZrO_2	7.5 - 10.5

and optionally at least one refining agent in a standard amount for refining.

6. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO_2	70 - 75
B_2O_3	15 - 18
Li_2O	0 - 1
Na_2O	0 - 3
K_2O	5 - 8
with $\text{Li}_2\text{O} + \text{Na}_2\text{O} + \text{K}_2\text{O}$	5.5 - 10.5
CaO	0 - 1
BaO	0 - 1
TiO_2	0 - 1
ZrO_2	0.8 - 5

and optionally at least one refining agent in a standard amount for refining.

7. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	67 - 70
B ₂ O ₃	15 - 18
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	7 - 10
with Li ₂ O + Na ₂ O + K ₂ O	7 - 12.5
ZnO	0 - 1
ZrO ₂	2.5 - 6

and optionally at least one refining agent in a standard amount for refining.

8. Aluminum-free borosilicate glass as defined in claim 1, characterized by a composition, in percent by weight, based on oxide content, of:

SiO ₂	74 - 78
B ₂ O ₃	12 - 15
Li ₂ O	0 - 1
Na ₂ O	0 - 3
K ₂ O	3 - 8
with Li ₂ O + Na ₂ O + K ₂ O	3 - 11
ZnO	0 - 1
ZrO ₂	2.5 - 7

and optionally at least one refining agent in a standard amount for refining.

9. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.2 percent by weight of said Li_2O .

10. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.3 percent by weight of said Na_2O .

11. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.5 percent by weight of said Na_2O .

12. Aluminum-free borosilicate glass as defined in claim 1, and containing at least 0.2 percent by weight of said Li_2O and at least 0.3 percent by weight of said Na_2O .

13. Aluminum-free borosilicate glass as defined in claim 1, free of As_2O_3 and Sb_2O_3 apart from inevitable impurities thereof.

14. Aluminum-free borosilicate glass as defined in claim 1, having a coefficient of thermal expansion α (20°C ; 300°C) of between $3.0 \times 10^{-6} / \text{K}$ and $6 \times 10^{-6} / \text{K}$ and a working point V_A of between 990°C and 1290°C .

15. A primary pharmaceutical packaging material consisting of the aluminum-free borosilicate glass as defined in claim 1.

16. A glass fiber comprising the aluminum-free borosilicate glass as defined in claim 1.

17. The glass fiber as defined in claim 16, and having a composition and properties for reinforcing concrete.

18. A sealing glass for tungsten, molybdenum or KOVAR® consisting of the aluminum-free borosilicate glass as defined in claim 1.

19. A fluorescent lamp made with the aluminum-free borosilicate glass as defined in claim 1.

20. The fluorescent lamp as defined in claim 19 and consisting of a miniaturized fluorescent lamps.

21. An apparatus glass consisting of the aluminum-free borosilicate glass as defined in claim 1.